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Radio communication unit e.g. for facsimile, has radio switching system to change communication mode so that communication with mobile unit or base station is performed via ISDN circuit based on communication mode

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Abstract (Basic): *JP 2000174922* A

NOVELTY - A communication unit communicates with a mobile unit via ISDN circuit (103) in one operation mode and communicates with a base station via ISDN circuit in another operation mode. Radio switching system (105) switches the communication mode of the communication unit.

USE - E.g. for facsimile.

ADVANTAGE - Enables to utilize the facsimile as a cordless telephone answering machine or as a radio facsimile at a low cost.

DESCRIPTION OF DRAWING(S) - The figure shows block diagram of communication system.

ISDN circuit (103)

Radio switching system (105)

pp; 17 DwgNo 1/10

Title Terms: RADIO; COMMUNICATE; UNIT; FACSIMILE; RADIO; SWITCH; SYSTEM; CHANGE; COMMUNICATE; MODE; SO; COMMUNICATE; MOBILE; UNIT; BASE; STATION; PERFORMANCE; ISDN; CIRCUIT; BASED; COMMUNICATE; MODE

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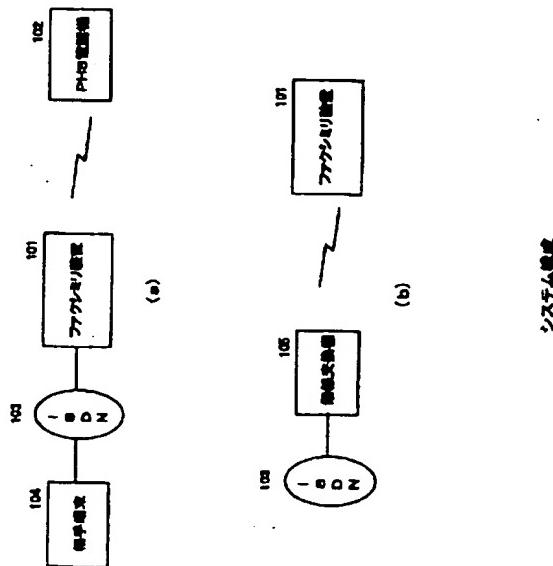
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(54)【発明の名称】通信装置

(57)【要約】

【課題】 コードレス留守番電話機能付きファクシミリ装置(親機)としての利用形態と無線ファクシミリ(子機)としての利用形態に低コストで対応できる通信装置を提供することを目的とする。

【解決手段】 ファクシミリ装置に、デジタル無線親機機能と子機機能を切り替える機能を設けることによって、汎用のコードレス電話機能付きファクシミリ装置と同じ内部構成のままで無線ファクシミリを実現することを可能にする。すなわち、デジタル無線回線における親機として動作するとともに、子機と通信する第1のモードと、前記デジタル無線回線における子機として動作するとともに、親機と通信する第2のモードとを設け、これらモードを切り替えることにより、1台のファクシミリ装置によって親機としても子機としても機能できるようにする。



処理に第1のプロトコル処理を行う工程を有し、前記第2のモードにおいて、デジタル無線回線での通信処理に第2のプロトコル処理を行う工程を有する、ことを特徴とする通信装置の制御方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、P H S等のデジタル通信回線に接続されるファクシミリ装置等の通信装置に関する。

【0002】

【従来の技術】従来より、無線通信機能を有するファクシミリ等の通信装置に関しては、既に様々な提案がなされており、種々の形態を有するものが知られている。

【0003】例えば第1の形態としては、いわゆるコードレス電話機能付きファクシミリ装置で、ファクシミリ装置を親機として動作させ、コードレス子機との間を無線で接続して音声を伝送するものである。例えば、特開平7-203174号や、特開平7-312666号において、ファクシミリ装置をコードレス電話の親機として機能させる手段が開示されている。

【0004】また、第2の形態としては、いわゆる無線ファクシミリ装置で、ファクシミリ装置を子機として動作させ、公衆無線回線等に接続して携帯ファクシミリ端末としてファクシミリ信号を伝送するものである。例えば、特開平6-030232号や、特開平9-93319号においては、ファクシミリ装置において読み取った画像データを無線で無線親機に送信する手段が開示されている。

【0005】そして、上記2つの従来例は、それぞれ独立したものであり、コードレス電話機能付きファクシミリ装置と無線ファクシミリ装置とは異なる商品として開発されていた。

【0006】

【発明が解決しようとする課題】しかしながら、近年では、オフィス等への無線交換システムの導入が進み、据え置き型のファクシミリ装置を無線交換システムに接続する必要が出てきている。例えば、通常の有線通信回線に接続されるファクシミリ装置等の通信装置を使用する環境が変わって、無線通信回線しか使用できなくなると、その通信装置を使用することができなくなるという問題があった。そこで、電話回線に接続できる通信装置を、必要に応じて無線回線にも接続できるようにすることが求められてきている。

【0007】これを実現する手段としては、コードレス電話機能付きファクシミリ装置の形態と無線ファクシミリ装置の形態を、ともに内蔵した構成が考えられる。しかし、この場合は高価な無線処理部を2個搭載する必要があり、コスト面での問題があった。

【0008】そこで本発明は、親機としての利用形態と子機としての利用形態に低コストで対応できる通信装置

を提供することを目的とする。

【0009】

【課題を解決するための手段】本発明は、ファクシミリ装置等の通信装置に、デジタル無線親機機能と子機機能を切り替える手段を設けることによって、汎用のコードレス電話機能付きファクシミリ装置等の通信装置を、有線通信回線のある環境でも、無線通信回線のある環境でも使用できるようにするものである。

【0010】また、汎用のコードレス電話機能付きファクシミリ装置と同じ内部構成のままで無線ファクシミリを実現することを可能にするものである。

【0011】具体的には、本発明の請求項1、7において、前記デジタル無線回線における親機として動作するとともに、子機と通信する第1のモードと、前記デジタル無線回線における子機として動作するとともに、親機と通信する第2のモードを、切り替えることにより、1台の通信装置によって親機としても子機としても機能するようにするものである。

【0012】また本発明の請求項2、8では、第1のモードにおいて、デジタル無線回線から受信したデータを有線通信回線に送信し、第2のモードにおいて、デジタル無線回線から受信したデータを本通信装置が有するデータ処理部に入力することにより、親機として動作する場合にはデジタル無線回線から受信したデータを公衆通信回線に送信し、子機として動作する場合にはファクシミリ等の画像データを無線で送信できるようにするものである。

【0013】また本発明の請求項3、9では、第1のモードにおいて、デジタル無線回線から受信したデータをデジタル／デジタル符号化変換をしてデジタル公衆通信回線に送信し、第2のモードにおいて、デジタル無線回線から受信したデータをデジタル／アナログ変換をしてデータ処理部に入力することにより、親機として動作する場合に、無線回線と公衆回線の伝送速度や信号形式が異なるときにも無線回線のデータを公衆回線に送信可能にするとともに、子機として動作する場合に、アナログ信号をデジタル無線回線で伝送できるようにするものである。

【0014】また本発明の請求項4、10では、デジタル／デジタル符号化変換部とデジタル公衆通信回線の間に挿入される第1の信号切替スイッチと、デジタル／デジタル符号化変換部とアナログ／デジタル変換部の間に挿入される第2の信号切替スイッチを設けることにより、親機として機能する場合と子機として機能する場合で同じ回路を共通に使用することを可能にするものである。

【0015】また本発明の請求項5、11では、第1のモードと第2のモードで無線通信処理プロトコルを異なるものにすることにより、ソフト動作の点でも親機と子機の両方に対応できるようにするものである。

力する信号線であり、PIAFSコントローラ221に接続されている。

【0037】最後にモードスイッチ234は、本ファクシミリ装置101を親機として使用するか子機として使用するかを選択するためのスイッチである。このモードスイッチ234はPHS処理部223内のCPU301に接続されている。

【0038】図3は、PHS処理部223の構成を示すブロック図である。

【0039】同図において、CPU301は、PHS間連の制御を行うものであり、RAM、ROMを内蔵している。また、信号線302はデータバスである。

【0040】PHSベースバンド処理部303は、PHS伝送フレームの組立／分解処理を行うものであり、PHSフレームの2スロット分の処理を行うことができる。高周波部304は、伝送するデータを1.9GHz帯で搬送するための周波数変換処理を行う。また、305はアンテナである。

【0041】ADPCM／PCM変換部306、307は、PHS無線伝送で使用される32KbpsのADPCM符号化音声データをISDNで使用される64KbpsのPCM符号化音声データに変換するものである。

【0042】1.460変換部308、309は、PHS無線伝送されたデータをISDN回線に送信するためには、32Kbpsのデータを64Kbpsに速度変換する機能を有する。PCMコーデック310、311は、アナログスイッチから入力されるアナログ信号233、234を64KbpsのPCM符号化データに変換する機能を有する。

【0043】スイッチ312は、PHSベースバンド処理部303から出力される32Kbpsのデータにどのような処理を加えるかの選択を行う。スイッチ313は、PHSベースバンド処理部303から出力される2チャネルの32Kbpsデータのうち、どちらをPIAFSコントローラ221に接続するかの選択を行う。

【0044】スイッチ314、315は、それぞれ64Kbps伝送路230、231に接続するデータを選択する。

【0045】スイッチ316、317は、本実施例で重要な機能を有するスイッチであり、無線回線から受信してPCM変換されたデータをISDN回線に送信するバスに接続するか、アナログ変換するためのPCMコーデック310、311に入力するバスに接続するかを切り替えるものである。

【0046】スイッチ318、319も、本実施例で重要な機能を有するスイッチであり、PCMコーデック310、311へISDN回線から受信したデータを接続するか、無線回線から受信したデータを接続するかを切り替えるものである。

【0047】なお、以上のスイッチ312～319はC

PU301によって制御される。

【0048】本実施例のファクシミリ装置101を従来のファクシミリ装置と比べた場合の内部構成面での差としては、スイッチ316～319の有無の違いが挙げられる。これらスイッチ316～319によって、本ファクシミリ装置101が親機としても子機としても機能することが可能となっている。

【0049】図4は、本ファクシミリ装置101が親機として機能している場合で、PHS電話機102を使つた通話をする場合のデータバスを示すブロック図であり、図5は、本ファクシミリ装置101が親機として機能している場合でFAX通信を行う場合のデータバスを示すブロック図である。また、図6は、本ファクシミリ装置101が子機として機能している場合のデータバスを示す説明図である。

【0050】また、図7、図8は、PHSにおける発信時の動作を示すシーケンス図であり、図7は、ファクシミリ装置101が親機として機能する場合に、PHS電話機から発信される場合のシーケンスを示し、図8は、20 ファクシミリ装置101が子機として機能する場合に、ファクシミリ装置から発信する場合のシーケンスを示している。

【0051】また、図9は、ファクシミリ装置101がコードレス留守番電話機能付きファクシミリ装置（親機）として機能する場合の動作を示すフローチャートであり、図10は、ファクシミリ装置101が無線ファクシミリ（子機）として機能する場合の動作を示すフローチャートである。

【0052】以下、本実施例のファクシミリ装置101が親機として機能する場合と子機として機能する場合の動作について説明する。

(1) 親機として機能する場合の動作

ファクシミリ装置101の電源投入直後、モードスイッチ234の状態をCPU301が読み取る（S601）。このスイッチの値が“1”的場合には、本ファクシミリ装置101は親機として動作するものとして認識し（S602～S603）、CPU301はスイッチ316～319を制御する（S604）。

【0053】具体的には、PCMコーデック310、311のデジタル信号側がISDN回線側（信号線230、231）と接続されるようにする。スイッチ316、317は、それぞれスイッチ314と信号線230、スイッチ315と信号線231を接続するように切り替える。同時に、スイッチ318、319は、それぞれスイッチ314とPCMコーデック310、スイッチ315とPCMコーデック311を接続するように切り替える。

【0054】さらに、PHSプロトコル処理は、親機側の処理機能のみを起動する（S605）。

【0055】次に、PHS電話機102からISDNに

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【0071】PHSベースバンド処理部303において、PHSフレームに組み立てられた上で(S633)、高周波部304で変調されてアンテナ305から無線交換機105に対して送出され、無線交換機からISDN等の公衆通信回線に送信される(S634)。

【0072】以上は、ファクシミリ送信の場合であったが、ハンドセット213を用いた音声通信の場合も同様のバスである。電話発信要求があると(S635)、CPU206からCPU201に発信通知があり(S636)、CPU201はCPU301に指示して、無線回線の発信処理を行う(S637)。無線交換機から応答が返ると(S638)、CPU201はアナログスイッチ216を切り替えて(S639)、ハンドセットから入力されたアナログ音声信号がPCMコーデック310に入力されることになる(S640)。それ以降の手順は、ファクシミリ送信のS631以後と同様である。

【0073】以上のように、モードによってデータバスを切り替えるとともに、無線プロトコルの処理を切り替えることによって、親機として機能することも子機として機能することも可能となるものである。

【0074】すなわち、本実施例によれば、通信装置に第1のモードと第2のモードを切り替える機能を設け、第1のモードにおいては無線親機として動作し、第2のモードにおいては無線子機として動作するようになると、以下のような効果を得ることができるものである。

【0075】(1)汎用のコードレス電話機能ファクシミリ装置等の通信装置を、有線通信回線のある環境でも、無線通信回線のある環境でも使用できるようにすることができる。

【0076】(2)汎用のコードレス電話機能付きファクシミリ装置と同じ内部構成のまま無線ファクシミリを実現することを可能になり、量産効果を高めることができる。

【0077】(3)無線ファクシミリは、コードレス電話機能付きファクシミリから一部の部品を削除することで実現でき、設計工数の削減を行うことができる。【第2実施例】上記第1実施例においては、電源投入時のモード切替によって親機としても子機としても機能するファクシミリ装置を説明した。しかしながら、部品の搭載の有無によって親機として機能させるか、子機として機能させるかを切り替える場合にも同様の効果を期待できる。

【0078】この場合、親機と子機の場合で同じ回路と構成をとりながらも、子機として動作する場合にはISDNインターフェイス部の部品を実装しないという処理により、コストダウンを実現することも可能になる。

【第3実施例】上記第1実施例においては、無線通信回線としてPHSを想定し、公衆通信回線としてISDNを想定していた。しかし、無線通信回線としては、DE

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CT等の他の通信方式を用いても同様であり、公衆回線としてはアナログ公衆回線を使用しても同様の効果を得ることが可能である。

【第4実施例】上記各実施例においては、ファクシミリ装置を想定していたが、ファクシミリ機能を有していない通信装置であっても同様の効果を得ることは可能である。

【第5実施例】上記各実施例では、電源立ち上げ時にモードスイッチの値を読み込むことでモードの切替を行うものであった。しかしながら、オペレーションパネルを使った設定等、他の手段によってモードをCPUに対して通知することによっても、同様の効果を得ることは可能である。

【0079】

【発明の効果】以上説明したように、本実施例によれば、通信装置に第1のモードと第2のモードを切り替える機能を設け、第1のモードにおいては無線親機として動作し、第2のモードにおいては無線子機として動作するようになると、通信装置を、有線通信回線のある環境でも、無線通信回線のある環境でも低コストの構成により使用できるようにすることができる効果がある。

【図面の簡単な説明】

【図1】本発明の第1実施例におけるシステム構成を示すブロック図である。

【図2】上記第1実施例におけるファクシミリ装置の構成を示すブロック図である。

【図3】上記第1実施例におけるファクシミリ装置のPHS処理部の構成を示すブロック図である。

【図4】上記第1実施例におけるファクシミリ装置が親機として機能している場合で、PHS電話機102を使った通話をする場合のデータバスを示すブロック図である。

【図5】上記第1実施例におけるファクシミリ装置が親機として機能している場合でFAX通信を行う場合のデータバスを示すブロック図である。

【図6】上記第1実施例におけるファクシミリ装置が子機として機能している場合のデータバスを示す説明図である。

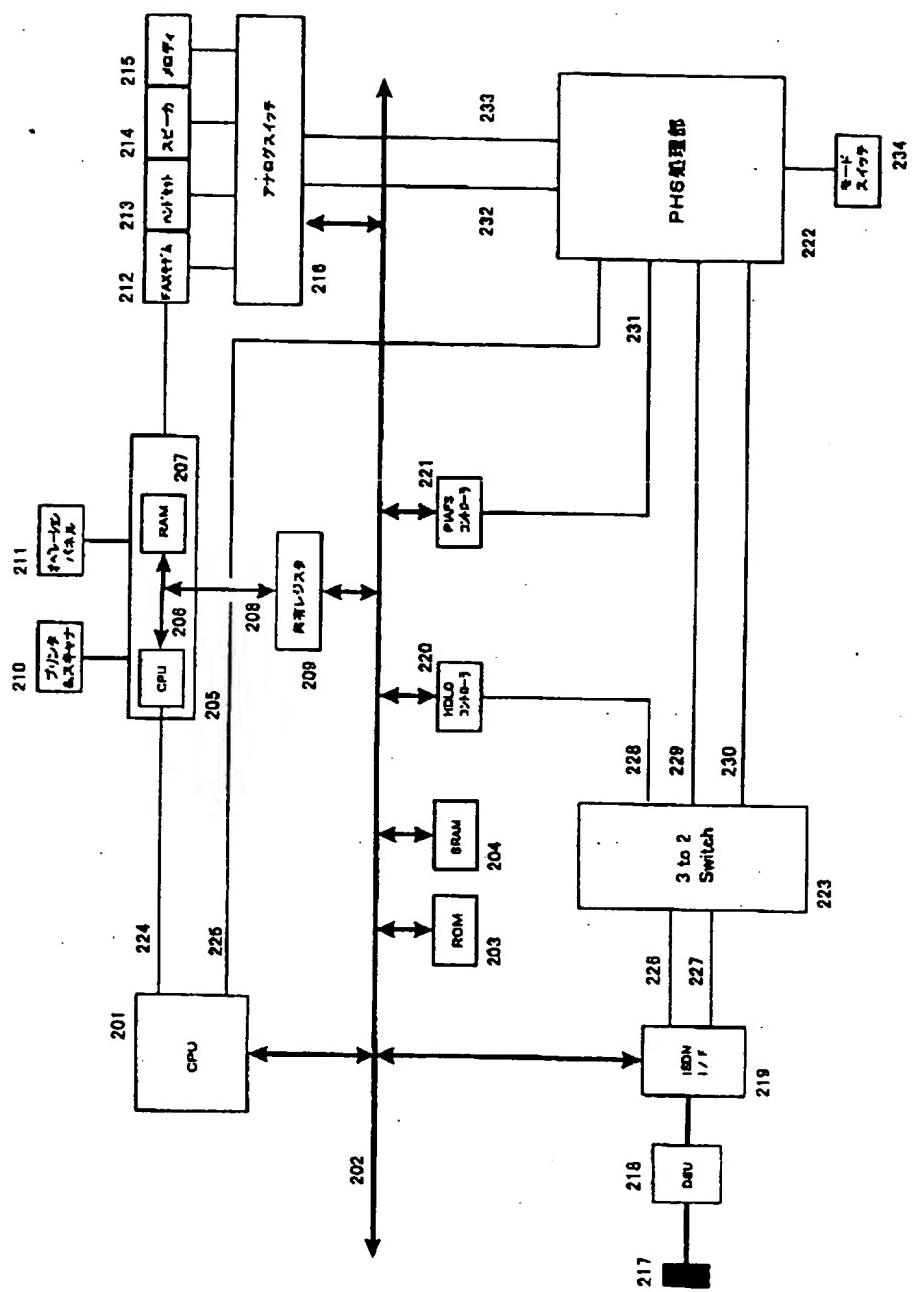
【図7】上記第1実施例におけるファクシミリ装置が親機として機能する場合に、PHS電話機から発信される場合の動作を示すシーケンスチャートである。

【図8】上記第1実施例におけるファクシミリ装置が親機として機能する場合に、ファクシミリ装置から発信する場合の動作を示すシーケンスチャートである。

【図9】上記第1実施例におけるファクシミリ装置がコードレス留守番電話機能付きファクシミリ装置(親機)として機能する場合の動作を示すフローチャートである。

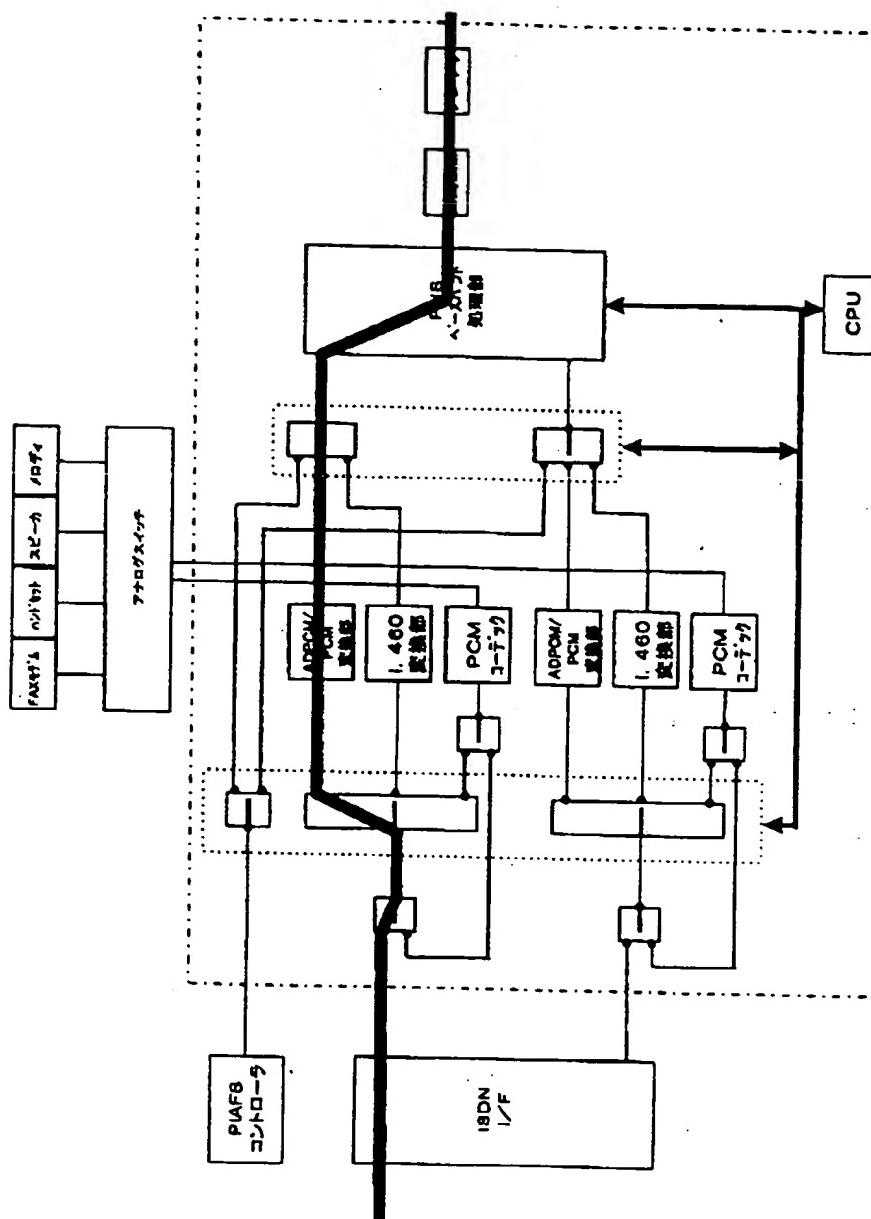
【図10】上記第1実施例におけるファクシミリ装置が無線ファクシミリ(子機)として機能する場合の動作を示すフローチャートである。

〔图2〕



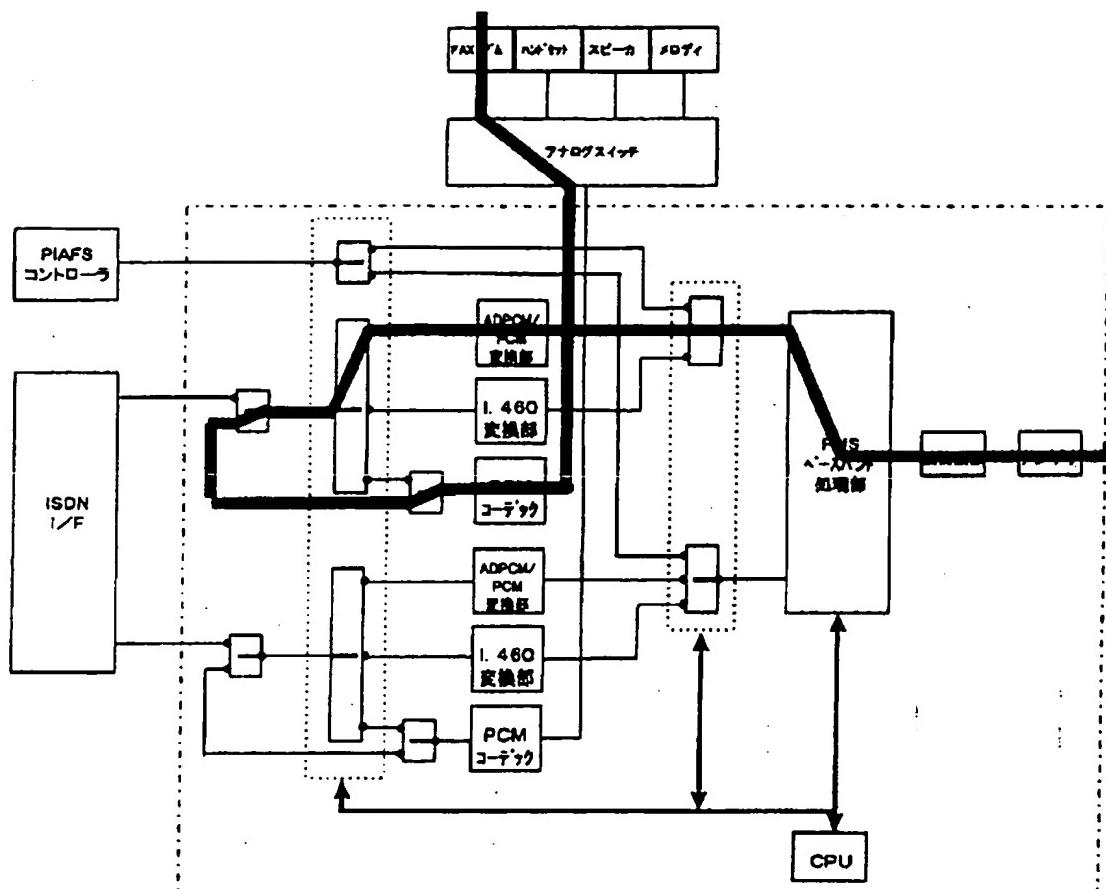
ファクシミリ装置のハード構成

【図4】



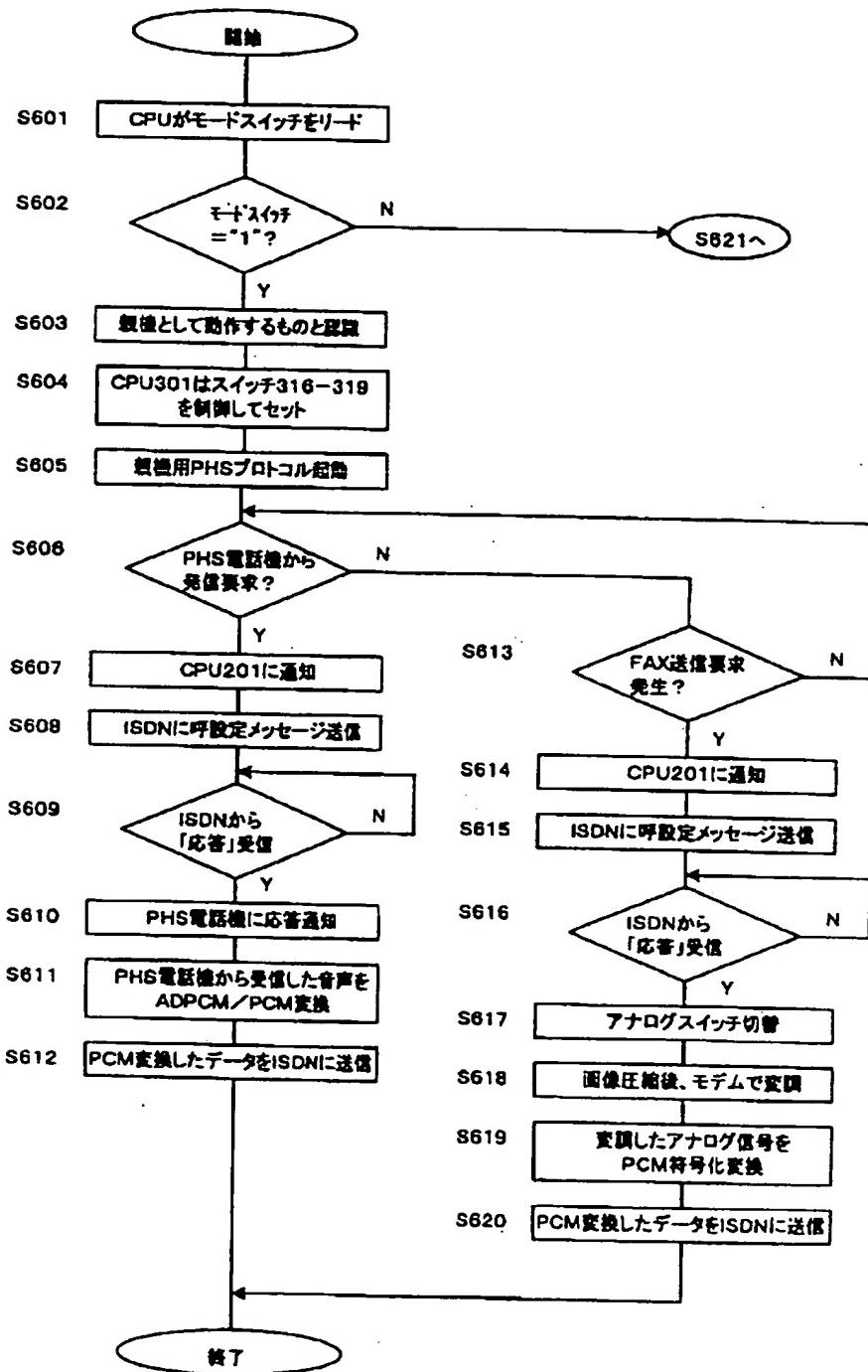
親機動作の場合のデータバス(電話時)

【図6】



子機動作の場合のデータバス(FAX通信時)

【図9】



補機モードでの動作フローチャート

フロントページの続き

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COMMUNICATION DEVICE
[通信装置]

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(57) [Abstract]

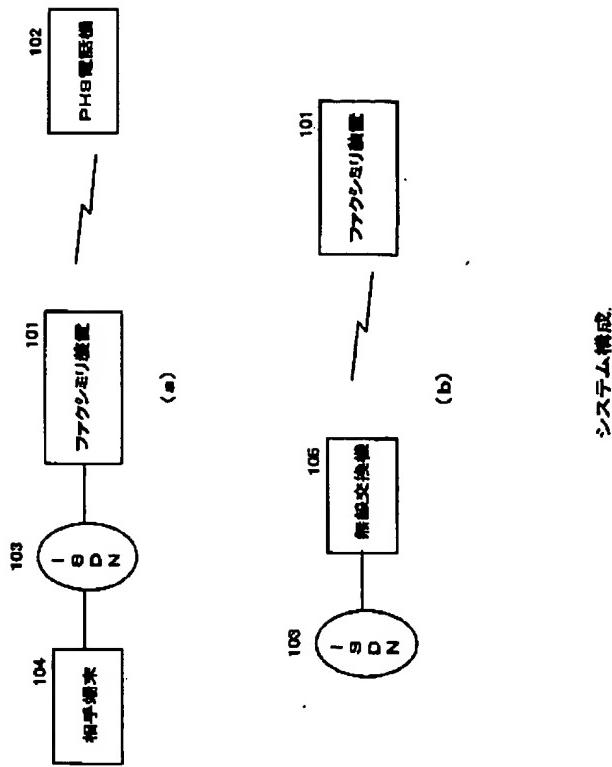
[Problems to be Solved by the Invention]

communication device which it can correspond to use form use form and wireless facsimile cordless answering machine function equipped facsimile equipment (parent device) as (peripheral) as with low cost is offered makes objective.

[Means to Solve the Problems]

In facsimile equipment, function which changes digital wireless parent device function and peripheral function is provided, as common cordless telephone talent equipped facsimile equipment with while it is same internal configuration wireless facsimile is actualized makes possible with.

As it operates as parent device in namely, digital wireless circuit, peripheral and as peripheral in first mode and the aforementioned digital wireless circuit which communication as it operates are done, parent device and it provides second mode which communication is done, by changing these mode, with facsimile equipment of 1 as parent device also as peripheral try to be able to function.



[Claim(s)]

[Claim 1]

In communication device which possesses means which does communication which used digital wireless circuit,

As it operates as parent device in the aforementioned digital wireless circuit, peripheral and communication first mode which is done and,

As it operates as peripheral in the aforementioned digital wireless circuit, parent device and communication second mode which is done and,

The aforementioned first mode and changeover means which changes second mode

communication device which it possesses and makes feature

[Claim 2]

In Claim 1,

In the aforementioned first mode, means which transmits data which is received from means wired communication circuit which transmits data which is received from digital wireless circuit to wired communication circuit to digital wireless circuit possessing,

In the aforementioned second mode, it possesses means which transmits data which is outputted from means the aforementioned data processing part which is inputted into data processing part where this communication device has data which is received from digital wireless circuit to digital wireless circuit,

communication device which is made feature

[Claim 3]

In Claim 1,

first conversion means which does connection means and digital/digital coding conversion and opposite coding conversion which are connected to digital public communication circuit and second conversion means which digital/analog converts and converts analog/digital possessing,

In the aforementioned first mode, to possess means which doing digital/digital opposite coding conversion, transmits data which it receives from means digital public communication circuit which converting digital/digital coding, transmits data which is received from digital wireless circuit to digital public communication circuit to digital wireless circuit, in the the aforementioned second mode, data which is received from digital wireless circuit converting digital/analog, analog/digital converting data which is outputted from means the aforementioned data processing part which it inputs into data processing part which this communication device has, it possesses means which it transmits to digital wireless circuit,

communication device which is made feature

[Claim 4]

In Claim 3,

The the aforementioned first conversion means and first signal switch and the aforementioned first conversion means and is inserted between second conversion means second signal switch which are inserted between digital public communication circuit possessing,

In the aforementioned first mode, in order to connect the aforementioned first conversion means and digital public communication circuit, means which changes the aforementioned first switch possessing,

In the aforementioned second mode, in order to connect the aforementioned first conversion means and second conversion means, it possesses means which changes the aforementioned second switch,

communication device which is made feature

[Claim 5]

In Claim 1,

In the aforementioned first mode, means which treats first protocol in communication treatment with digital wireless circuit possessing,

In the aforementioned second mode, it possesses means which treats second protocol in communication treatment with digital wireless circuit,

communication device which is made feature

[Claim 6]

In any one claim of Claim 2~5, regarding the aforementioned second mode, the communication device which possesses means which does not mount interface circuit component which is connected to wired communication circuit and makes feature

[Claim 7]

In control method of communication device which possesses means which does the communication which used

digital wireless circuit,

As it operates as parent device in the aforementioned digital wireless circuit, peripheral and as peripheral in first mode and the aforementioned digital wireless circuit which communication as it operates are done, parent device and communication second mode which is done possessing,

control method of communication device which changes the aforementioned first mode and the second mode and makes feature

[Claim 8]

In Claim 7,

In the aforementioned first mode, as data which is received from the digital wireless circuit is transmitted to wired communication circuit, data which is received from wired communication circuit is transmitted to digital wireless circuit,

In the aforementioned second mode, as it inputs into data processing part where this communication device has data which is received from digital wireless circuit, data which is outputted from the aforementioned data processing part is transmitted to the digital wireless circuit,

control method of communication device which is made feature

[Claim 9]

In Claim 7,

In the aforementioned first mode, as converting digital/digital coding, it transmits the data which is received from digital wireless circuit to digital public communication circuit, doing digital/digital opposite coding conversion, it transmits data which it receives from digital public communication circuit to digital wireless circuit,

In the aforementioned second mode, as it inputs into data processing part where converting digital/analog, this communication device has data which is received from the digital wireless circuit, analog/digital converting data which is outputted from the aforementioned data processing part, it transmits to digital wireless circuit,

control method of communication device which is made feature

[Claim 10]

In Claim 9,

In the aforementioned first mode, first switch change step which connects the first conversion means and digital public communication circuit which do digital/digital coding conversion and opposite coding conversion

In the aforementioned second mode, second switch change step which connects the aforementioned first conversion means and second conversion means which digital/analog converts and converts analog/digital

control method of communication device which it possesses and makes feature

[Claim 11]

In Claim 7,

In the aforementioned first mode, step which treats first protocol in communication treatment with digital wireless circuit possessing,

In the aforementioned second mode, it possesses step which treats second protocol in communication treatment with digital wireless circuit,

control method of communication device which is made feature

[Description of the Invention]

[0001]

[Technological Field of Invention]

this invention regards facsimile equipment or other communication device which is connected to PHS or other digital communication circuit.

[0002]

[Prior Art]

From until recently, various propositions have already done in regard to facsimile or other communication device which possesses radio communicator talent, those which possess the various morphological form are known.

[0003]

As for example first morphological form, with so-called cordless telephone talent equipped facsimile equipment, operating with the facsimile equipment as parent device, connecting between cordless peripheral with wireless, it is something which voice transmission is done.

means which functions in for example Japan Unexamined Patent Publication Hei 7-20 31 74 number and Japan Unexamined Patent Publication Hei 7-31 2666 number, with facsimile equipment as parent device of cordless telephone is disclosed.

[0004]

In addition, with so-called wireless facsimile equipment, operating with facsimile equipment as peripheral, connecting to public wireless circuit etc as second morphological form, it is something which the facsimile signal transmission is done as portable facsimile terminal.

Regarding for example Japan Unexamined Patent Publication Hei 6-030232 number and Japan Unexamined Patent Publication Hei 9-93 31 9 number, means which is transmitted to wireless parent device with wireless has been disclosed image data which is grasped in facsimile equipment.

[0005]

And, the above-mentioned 2 Prior Art Example being something which becomes independent respectively, were developed cordless telephone talent equipped facsimile equipment and wireless facsimile equipment as product which differs.

[0006]

[Problems to be Solved by the Invention]

But, recently, introduction of wireless exchange system to office etc advances, necessity to connect facsimile equipment of stationary to the wireless exchange system has arisen.

environment which uses facsimile equipment or other communication device which is connected to for example conventional wired communication circuit changing, when only radio communication circuit you can use and

become, there was a problem that communication device becomes impossible is used.

Then, it tries to be able to connect communication device which can be connected to telephone circuit, to also according to need wireless circuit it has been sought.

[0007]

You can think morphological form of cordless telephone talent equipped facsimile equipment and the constitution which builds in morphological form of wireless facsimile equipment, together as the means which actualizes this.

But, in this case it was necessary 2 to install expensive wireless processor, there was a problem with cost aspect.

[0008]

this invention offers communication device which it can correspond to use form as the use form and peripheral as parent device with low cost makes the objective then.

[0009]

[Means to Solve the Problems]

this invention in facsimile equipment or other communication device, provides means which changes digital wireless parent device function and peripheral function, common cordless telephone talent equipped facsimile equipment or other communication device, and it is something which it tries to be able to use with environment which has radio communication circuit with environment which has wired communication circuit with.

[0010]

In addition, as common cordless telephone talent equipped facsimile equipment wireless facsimile is actualized is something which is made possible with while it is same internal configuration.

[0011]

Concrete, as it operates as parent device in the aforementioned digital wireless circuit in Claim 1, 7 of this invention, peripheral and as peripheral in first mode and the aforementioned digital wireless circuit which communication as it operates are done, the parent device and communication in changing second mode which is done, depending, With communication device of 1 as parent device also as peripheral it is something which it tries to function.

[0012]

In addition with Claim 2,8 of this invention, data which is received from digital wireless circuit in first mode, is transmitted to wired communication circuit, when it operates by inputting into data processing part where this communication device has data which is received from digital wireless circuit in second mode, as parent device data which is received from digital wireless circuit is transmitted to public communication circuit, When it operates as peripheral it is something which it tries to be able to transmit facsimile or other image data with wireless.

[0013]

In addition when with Claim 3, 9 of this invention, converting digital/digital coding, transmits data which is received from digital wireless circuit in first mode, to digital public communication circuit, it operates by converting digital/analog, inputting data which is received from digital wireless circuit in second mode, into data processing part, as parent device, When transmission velocity of wireless circuit and public circuit and signal form differs even, as data of wireless circuit in public circuit it is made transmission possible, when it operates as peripheral, analog signal with digital wireless circuit it is something which transmission that it tries it is possible.

[0014]

In addition with Claim 4,10 of this invention, when it functions by providing digital/digital coding converting part and first signal switch and digital/digital coding converting part and is inserted between analog/digital converting part second signal switch which are inserted between digital public communication circuit, as parent device and same circuit commonly is used is something which is made possible with when it functions as peripheral.

[0015]

In addition with Claim 5,11 of this invention, it is something which it tries to be able to correspond to both of parent device and peripheral even in point of software operation radio communication treatment protocol by doing to that differs with first mode and second mode.

[0016]

In addition with Claim 6 of this invention, part of interface part which is connected to wired communication circuit regarding second mode is not mounted by the fact that it makes possible, is something which makes the cost reduction when it operates with second mode possible.

[0017]

{Embodiment of Invention and Working Example }

As for [first Working Example] Figure 1, with block diagram which shows system configuration in first Working Example of this invention, Figure 1 (a) facsimile equipment of this working example shows the constitution when it functions as parent device of cordless telephone talent equipped facsimile equipment, Figure 1 (b) facsimile equipment of this working example has shown the constitution when it functions as wireless facsimile equipment.

[0018]

Way it shows in Figure 1 (a), when facsimile equipment of this working example it functions as parent device of cordless telephone talent equipped facsimile equipment, facsimile equipment 101 digital public communications network (ISDN) is connected by 103, PHS cordless telephone 102 is connected with wireless as the peripheral.

In addition, through digital public communications network 103, corresponding terminal 104 and communication are done.

[0019]

On one hand, way it shows in Figure 1 (b), when facsimile equipment of this working example it functions as wireless facsimile equipment, wireless interchangeable equipment 105 is connected by digital public communications network 103 , the facsimile equipment 101 of this working example is connected to wireless interchangeable equipment 105 with wireless.

[0020]

Figure 2 is block diagram which shows constitution of facsimile equipment 101.

[0021]

As for CPU 201, through data bus and address bus 202, with central control part which controls this facsimile equipment 101 entirety, control program etc of CPU 201 is housed in the ROM 203 , RAM204 is used as area in order to remember various data.

[0022]

FAX engine control part 205 being something which controls transport system of facsimile equipment 101, has CPU

206, RAM207, data bus 208.

[0023]

Joint ownership register 209 is something in order to exchange data between CPU 201 side system and CPU 206 side system.

[0024]

color printer/color scanner 210 color printer and is something which possesses color scanner where do monochrome image or color image which do print out of monochrome image or color image reading.

operation panel 211 is something where user does various key input.

[0025]

As for FAX modem 212, being something which does modulation-demodulation etc of the transmission and reception signal, as for hand setting 213, it is something in order to speak by telephone as telephone.

speaker 214 is something which does voice amplification telephone call or other various audio output.

reservation melody generating part 215 is something which generates melody sound at the time of reservation.

[0026]

FAX modem 212, hand setting 213 above, speaker 214, reservation melody generating part 215 is connected, as it is controlled to FAX engine control part 205, analog switch 216, analog data of voice or the facsimile is connected to public communication circuit with analog switch 216 going by way of.

[0027]

As for modular connector 217, being something which connects ISDN (Point U), as for DSU218, it is something which converts data which is exchanged between bureau interchangeable equipment to signal of TTL level.

ISDN interface part 219 controls to layer 1~layer 3 of ISDN, possesses input-output function of data of B channel of ISDN.

[0028]

HDLC controller 220 does assembly per minute solution treatment of data of HDLC format in ISDN.

wireless data communication protocol processor (PIAFS controller) 221 does frame assembling per minute solution treatment of wireless data communication protocol format.

[0029]

PHS processor 222 being something protocol treats PHS radio communication and PCM coding transform etc, shows details in Figure 3.

[0030]

pass switch 223, has function which changes you connect data which transmission is done to which of HDLC controller 220, PHS processor 222 with B1 channel and B2 channel of ISDN with control of CPU 201.

[0031]

Next, meaning of principal signal line is explained.

[0032]

As for signal line 225, with serial communication signal line which exchanges control signal between the CPU 201 and CPU 205, as for signal line 226, it is a serial communication signal line which exchanges control signal between CPU 201 and PHS processor 223.

[0033]

signal line 227,228 is 64 kbps serial transmission signal line of B1 channel,B2 channel of respective ISDN.

[0034]

As for signal line 229, with serial communication signal line which input-output is done, transmission of data of HDLC frame format is done in HDLC controller.

[0035]

signal line 230,2 31, with serial communication signal line which input-output is done, is transmission velocity of 64 kbps in PHS processor 222.

data, which converts 32 kbps signal which transmission are done to 64 kbps and data etc which converts analog signal which is inputted from the analog switch to 64 kbps PCM data transmission are done with wireless circuit.

Being transmitted from PHS telephone 102, in case of data which is outputted in ISDN circuit, from 32 kbps rate conversion (I.460) in 64 kbps in the inside PHS processor 223, it is outputted in signal line 230,231.

[0036]

signal line 232, with signal line which outputs 32 kbps which are received from wireless circuit in PHS processor 222, that way, is connected to PIAFS controller 221.

[0037]

It is a switch in order to select whether lastly mode switch 234 uses this facsimile equipment 101 as parent device, or uses as peripheral.

This mode switch 234 is connected to CPU 301 inside PHS processor 223.

[0038]

Figure 3 is block diagram which shows constitution of PHS processor 223.

[0039]

In same Figure, CPU 301 being something which controls related to PHS, has built in RAM, ROM.

In addition, signal line 302 is data bus.

[0040]

PHS base band processor 303 being something which does assembly per minute solution treatment of PHS transmission frame, treats equivalent to 2 slot of PHS frame, it is possible.

high frequency section 304 treats in order to convey data which transmission is done with 1.9 GHz band frequency

conversion.

In addition, 305 is antenna.

[0041]

ADPCM/PCM converting part 306,307 ADPCM coding voice data of 32 kbps which are used with PHS wireless transmission is something which is converted to PCM coding voice data of 64 kbps which are used with ISDN.

[0042]

I.460 converting part 308,309, in order to transmit data which PHS wireless transmission is done to ISDN circuit, data of 32 kbps has function which rate conversion is done in 64 kbps.

PCM co-deck 310,311 has function which converts analog signal 233,234 which is inputted from analog switch to PCM coded data of 64 kbps.

[0043]

switch 312 selects it adds which kind of treatment to data of 32 kbps which are outputted from PHS base band processor 303 of.

switch 313 selects among 32 kbps data of 2 channel which are outputted from PHS base band processor 303, you connect which to PIAFS controller 221 of.

[0044]

switch 314,315 selects data which respectively is connected to 64 kbps transmission path 230,231.

[0045]

Whether with switch which possesses important function with the this working example, receiving from wireless circuit, it is something which is changed the PCM you connect switch 316,317, to pass which transmits data which is converted to ISDN circuit, or analog you connect to pass which is inputted into PCM co-deck 310,311 in order to convert.

[0046]

It is something which is changed whether switch 318,319, with switch which possesses important function with this working example, you connect the data which is received from ISDN circuit to PCM co-deck 310,311, or you connect data which is received from wireless circuit.

[0047]

Furthermore, switch 312~319 above is controlled with CPU 301.

[0048]

As difference, you can list difference of presence or absence of switch 316~319 in internal configuration aspect when facsimile equipment 101 of this working example is compared with the conventional facsimile equipment.

With these switch 316~319, this facsimile equipment 101 as parent device also as peripheral it functions it has become possible.

[0049]

As for Figure 4, this facsimile equipment 101 with when it is functional as parent device, with block diagram which shows data pass when telephone call which used PHS telephone 102 is done, as for Figure 5, this facsimile equipment 101 it is a block diagram which shows data pass when FAX communication is done with when it is functional as parent device.

In addition, Figure 6 this facsimile equipment 101 is explanatory diagram which shows data pass when it is functional as peripheral.

[0050]

In addition, as for Figure 7, Figure 8, with sequence chart which shows the operation when dispatching in PHS, Figure 7, when facsimile equipment 101 it functions as parent device, shows sequence when it is dispatched from the PHS telephone, Figure 8, when facsimile equipment 101 it functions as peripheral, has shown sequence when it dispatches from facsimile equipment.

[0051]

In addition, as for Figure 9, facsimile equipment 101 with flowchart which shows operation when it functions cordless answering machine function equipped facsimile equipment (parent device) as, as for Figure 10, facsimile equipment 101 it is a flowchart which shows operation when it functions wireless facsimile (peripheral) as.

[0052]

When below, facsimile equipment 101 of this working example it functions as parent device and you explain concerning operation when it functions as peripheral.

It functions as (1) parent device operation when

Immediately after power on of facsimile equipment 101, CPU 301 grasps state of mode switch 234, (S601).

When value of this switch is “1”, as for this facsimile equipment 101 you recognize and as those which operate as parent device (S602~S603), CPU 301 controls switch 316~319 (S604).

[0053]

Concretely, digital signal side of PCM co- deck 310,311 tries is connected ISDN circuit side (signal line 230,231) with that.

In order to connect respective switch 314 and signal line 230, switch 315 and signal line 231,it changes switch 316,317.

Simultaneously, in order respective switch 314 and PCM co- deck 310, to connect switch 315 and PCM co- deck 311, it changes switch 318,319.

[0054]

Furthermore, PHS protocol treatment starts only processing function of parent device side (S605).

[0055]

Next, dispatching from PHS telephone 102 in relation to ISDN, through the ISDN, you explain concerning treatment when it does counterpart and telephone call which are connected.

[0056]

When dial is done in PHS telephone 102, PHS telephone 102 does dispatching treatment.

PHS telephone 102 transmits link channel establishment request, facsimile equipment 101 after this following to sequence which is shown in Figure 7 establishes the wireless circuit between PHS telephone 102.

[0057]

facsimile equipment 101 when addition information which follows that with call setting message where CPU 301 is sent from PHS telephone 102 is received (S606), notifies effect in relation to CPU 201 and (S607), ISDN interface part 219 transmits call setting message in indication of CPU 201 in relation to the ISDN (S608).

[0058]

When after this, response from ISDN is received, (S609), from the CPU 201 response notification is done in CPU 301, CPU 301 transmits response message in relation to PHS telephone 102 (S610).

[0059]

With this step, through ISDN from PC 102, between corresponding terminal 104 which is connected transmission and reception of B channel data becomes possible.

[0060]

In addition, with this step, voice data which was transmitted from the PHS telephone 102 is transmitted by ISDN103, voice data which is received from ISDN103 is transmitted to PHS telephone 102.

As exemplary pass, as shown in Figure 4, through antenna 305, high frequency section 304, the voice data which is received from wireless circuit is converted to base band digital signal in PHS base band processor 303.

[0061]

switch 312 is set in order to connect to ADPCM/PCM converting part 306, ADPCM voice data which is received from wireless circuit being converted by PCM coded data of 64 kbps, (S611), through switch 314, switch 316, is transmitted to ISDN (S612).

[0062]

When it operates as parent device, when facsimile transmission request occurs, (S613), the CPU 205 notifies facsimile transmission request to CPU 201 and (S614), CPU 201 which receives notification transmits call setting message to ISDN (S615).

When response message is received from ISDN, (S616), after changing analog switch 216, FAX transmission start indication is conveyed to the CPU 205, (S617).

[0063]

FAX original reading, is grasped compressing image which with the scanner 210, modulation it does CPU 205 with modem, (S618).

analog signal which modulation is done converts and inputting into PCM co- deck 310 with analog switch 216 going by way of, PCM coding (S619), PCM data which is converted, through switch 318, switch 314, switch 316, transmits to ISDN (S620).

pass in this case reaches point where it shows in Figure 5.

It functions as (2) peripheral operation when

Immediately after power on of facsimile equipment 101, CPU 301 grasps state of mode switch 234, (S601).

When value of this switch " 0 " is, as for this facsimile equipment 101 you recognize and as those which operate as peripheral (S621), CPU 301 controls switch 316~319 (S622).

[0064]

Concretely, digital signal side of PCM co- deck 310,311 tries to be connected with switch 318, 316, 314 and 319, 317, 315 going by way of, PCM/ADPCM converting part 306, 307.

[0065]

Furthermore, PHS protocol treatment starts only processing function of peripheral side (S623).

[0066]

Next, you explain concerning treatment when facsimile transmission is done in this mode.

[0067]

In operation panel 211, when FAX transmission operation is done, (S624), CPU 205 recognizes dial information which is inputted, notifies to CPU 201 (S625).

CPU 201 makes indication of dispatching to CPU 301 of the PHS processor 222, CPU 301 starts dispatching treatment of wireless circuit (S626).

[0068]

facsimile equipment 101 transmits link channel establishment request in relation to wireless interchangeable equipment 105, facsimile equipment 101 after this following to sequence which is shown in the Figure 8 establishes between wireless interchangeable equipment, wireless circuit.

When "Response" message is received from wireless interchangeable equipment 105, (S627), through wireless circuit, wireless interchangeable equipment 105, because it becomes state which is connected to ISDN 103, the CPU 301 response it was in CPU 201, it notifies, CPU 201 changes analog switch 216, (S628).

Consequently, effect of start of FAX transmission is notified to the CPU 206 and (S629), reading and data transmission of FAX original are started.

[0069]

CPU 206 starting scanner 210, starts reading of original, after doing compression, inputs image data which is grasped into FAX modem 212 (S630).

[0070]

With FAX modem 212, modulation doing data which is inputted, it converts to analog signal, analog signal which is converted is inputted into analog switch 216.

analog switch 216 is connected by PCM co- deck 310, is converted by PCM coded data of 64 kbps with PCM co-deck and 310 (S631), via switch 318, 316, 314, is inputted into ADPCM/PCM converting part 306.

Here, from PCM data of 64 kbps being converted by ADPCM data of 32 kbps, it is inputted into PHS base band processor 303 (S632), via switch 312.

[0071]

In PHS base band processor 303, after being assembled in PHS frame, (S633), modulation being done in high frequency section, 304 it is forwarded from antenna 305 in relation to wireless interchangeable equipment 105, from wireless interchangeable equipment is transmitted to ISDN or other public communication circuit (S634).

[0072]

Or more was, in case of facsimile transmission, but in case of speech communication which uses hand setting 213 it is a similar pass.

When there is telephone dispatching request, (S635), from CPU 206 there is dispatching notification in CPU 201 and (S636), CPU 201 indicating to CPU 301, does dispatching treatment of wireless circuit, (S637).

When response returns from wireless interchangeable equipment, (S638), CPU 201 changing the analog switch 216, (S639), means that analog speech signal which is inputted from hand setting is inputted into PCM co-deck 310, (S640).

Protocol after that is similar to after S631 of facsimile transmission.

[0073]

Like above, as data pass is changed with mode, treatment of the wireless protocol is changed, it is something where also it becomes possible to function as well as which functions child device machine, as parent device machine.

[0074]

According to namely, this working example, by fact that it tries to operate to operate as wireless peripheral regarding second mode to provide function which changes first mode and second mode in communication device regarding first mode as wireless parent device, like below it is something which can acquire effect.

[0075]

With environment which has wired communication circuit and it tries (1) common cordless telephone talent facsimile equipment or other communication device, to be able to use with environment which has radio communication circuit, it becomes possible.

[0076]

As (2) common cordless telephone talent equipped facsimile equipment wireless facsimile is actualized with while it is same internal configuration to become possible, mass production effect is raised, it is possible.

[0077]

Be able to actualize (3) wireless facsimile, it reduces design fabrication steps, is possible by fact that part of part is deleted from cordless telephone talent equipped facsimile.

Regarding [second Working Example] the above-mentioned first Working Example, with mode changeover at time of power on as parent device also as peripheral facsimile equipment which functions was explained.

But, when it changes whether it functions with presence or absence of installing part as parent device, or it functions as peripheral, similar effect can be expected.

[0078]

In this case, although taking same circuit and constitution with incase of parent device and peripheral, when it operates as peripheral, also it becomes possible to actualize cost reduction with treatment that, it does not mount part

of ISDN interface part.

Regarding [third Working Example] the above-mentioned first Working Example, PHS was supposed as the radio communication circuit, ISDN was supposed as public communication circuit.

But, as radio communication circuit, making use of DECT or other communications format even when being similar, using analog public circuit as public circuit, you obtain similar effect, it is possible.

Regarding [4th Working Example] the above-mentioned each Working Example, facsimile equipment was supposed, but it is possible to obtain similar effect even with communication device which has not possessed facsimile function.

With [5th Working Example] the above-mentioned each Working Example, at time power source to start those which do changeover of mode by fact that value of the mode switch is read.

But, mode is notified in relation to CPU with, it is possible, with other means such as setting which used operation panel to obtain similar effect.

[0079]

[Effects of the Invention]

As above explained, according to this working example, by fact that it tries to operate to operate as wireless peripheral regarding second mode to provide the function which changes first mode and second mode in communication device regarding first mode as wireless parent device, communication device, even with environment which has the wired communication circuit, In order with constitution of low cost to be able to use even with environment which has radio communication circuit, there is an effect which it is possible.

[Brief Explanation of the Drawing(s)]

[Figure 1]

It is a block diagram which shows system configuration in first Working Example of this invention.

[Figure 2]

It is a block diagram which shows constitution of facsimile equipment in the above-mentioned first Working Example.

[Figure 3]

It is a block diagram which shows constitution of PHS processor of facsimile equipment in the above-mentioned first Working Example.

[Figure 4]

facsimile equipment in the above-mentioned first Working Example with when it is functional as parent device, it is a block diagram which shows data pass when telephone call which used PHS telephone 102 is done.

[Figure 5]

facsimile equipment in the above-mentioned first Working Example it is a block diagram which shows the data pass when FAX communication is done with when it is functional as parent device.

[Figure 6]

facsimile equipment in the above-mentioned first Working Example it is a explanatory diagram which shows the data pass when it is functional as peripheral.

[Figure 7]

When facsimile equipment in the above-mentioned first Working Example it functions as parent device, it is a sequence chart which shows operation when it is dispatched from the PHS telephone.

[Figure 8]

When facsimile equipment in the above-mentioned first Working Example it functions as parent device, it is a sequence chart which shows operation when it dispatches from the facsimile equipment.

[Figure 9]

facsimile equipment in the above-mentioned first Working Example it is a flowchart which shows the operation when it functions cordless answering machine function equipped facsimile equipment (parent device) as.

[Figure 10]

facsimile equipment in the above-mentioned first Working Example it is a flowchart which shows the operation when it functions wireless facsimile (peripheral) as.

[Explanation of Symbols in Drawings]

101

facsimile equipment

102

PHS telephone

103

ISDN circuit

104

corresponding terminal

105

wireless interchangeable equipment

201

CPU

202

data bus and address bus

203

ROM

	204
RAM	205
FAX engine control part	206
CPU	207
RAM	208
data bus	209
Joint ownership register	210
color printer/color scanner	211
operation panel	212
FAX modem	213
hand setting	214
speaker	215
reservation melody. generating part	216
analog switch	217
modular connector	

DSU

ISDN interface part

HDLC controller

wireless data communication protocol processor

PHS processor

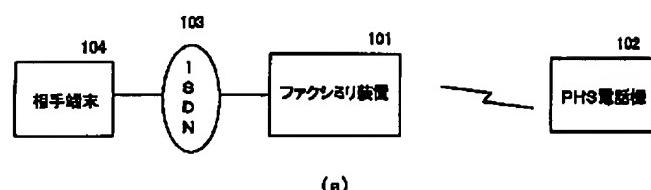
pass switch

mode switch

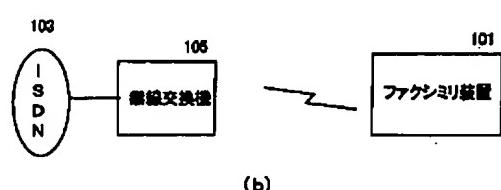
Drawings

[Figure 1]

System structure



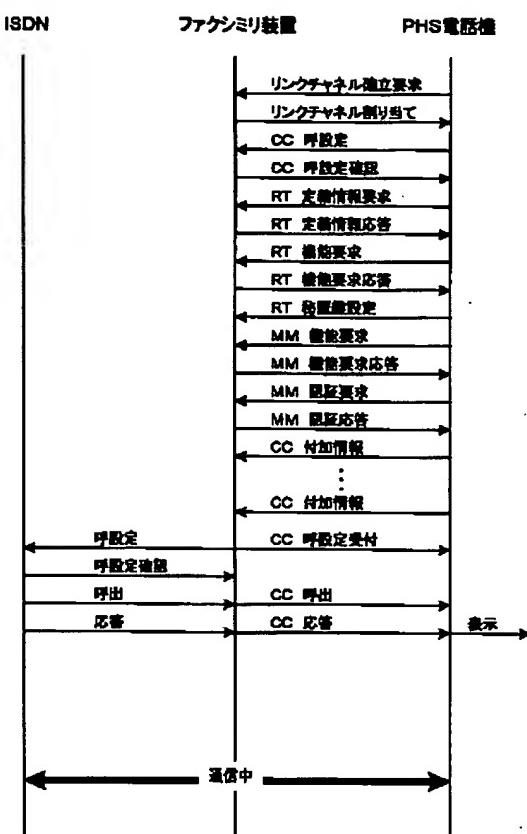
(a)



(b)

システム構成

[Figure 7]



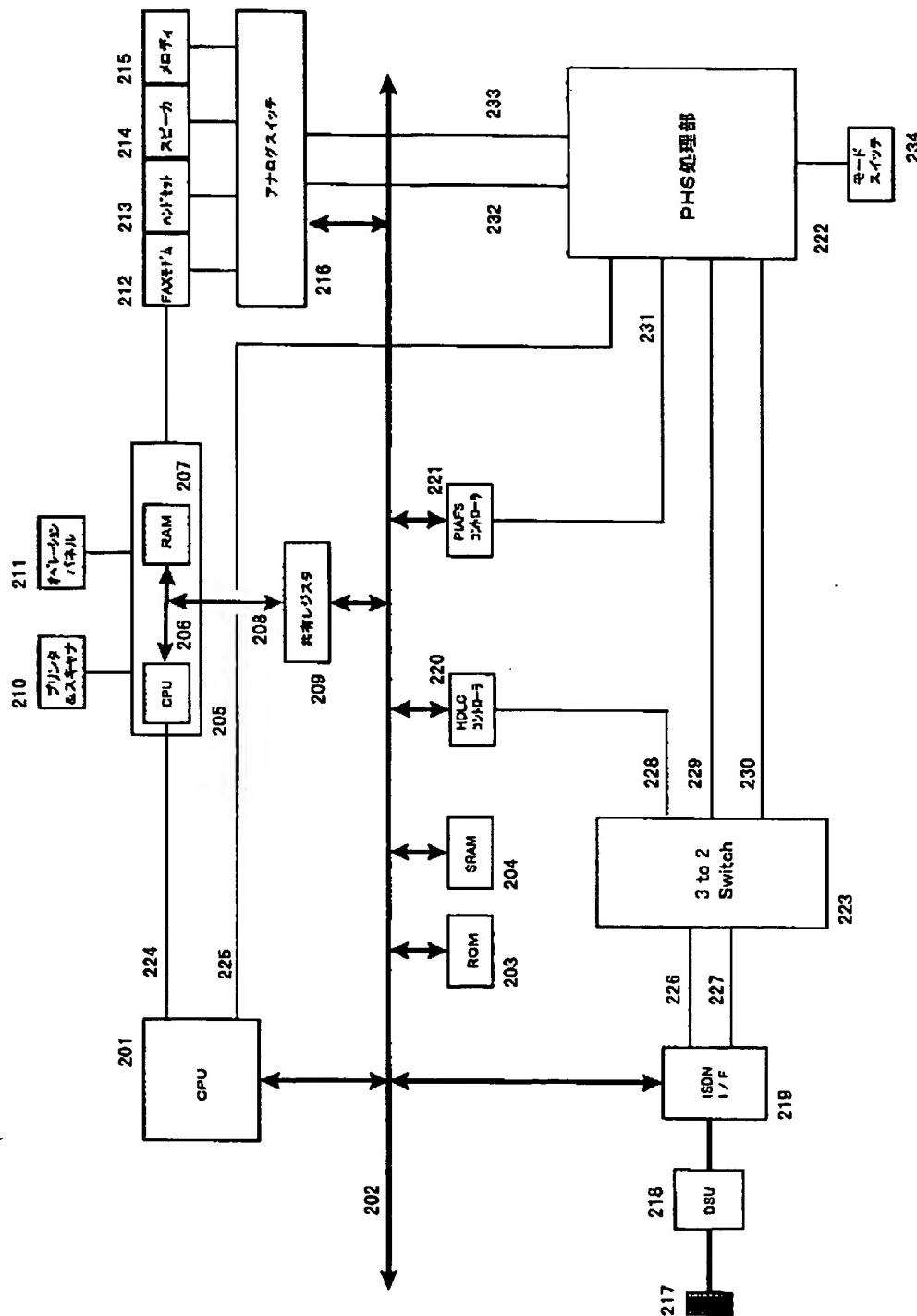
ファクシミリ装置が製機として機能する場合の発信シーケンス

[Figure 7; Translation]

1. Facsimile machine
2. PHS phone equipment
3. link channel establishment demand
4. link channel assigned
5. CC calling setup
6. CC calling setup confirmation
7. RT definition information demand
8. RT definition information response
9. RT function demand
10. RT function demand response
11. RT secret code setup
12. MM function demand
13. MM function demand response
14. MM confirmation demand
15. MM confirmation response
16. CC additional information
17. CC additional information
18. calling setup
19. CC calling setup reception
20. calling setup confirmation
21. calling
22. CC calling

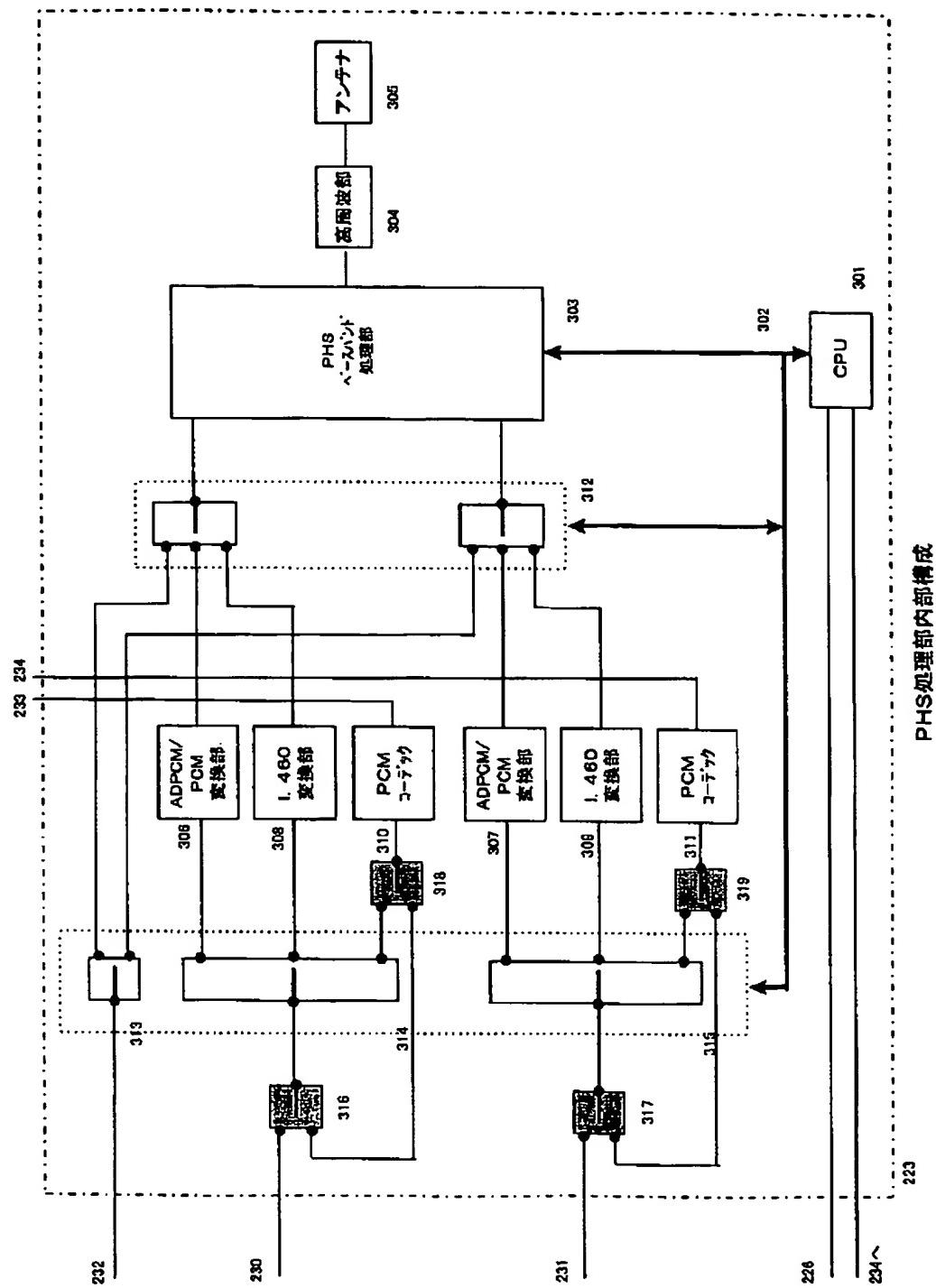
23. response
24. response
25. display
26. communicating
27. Transmission sequence when the facsimile machine functions as a parent machine

[Figure 2]
the hardware structure of the facsimile machine

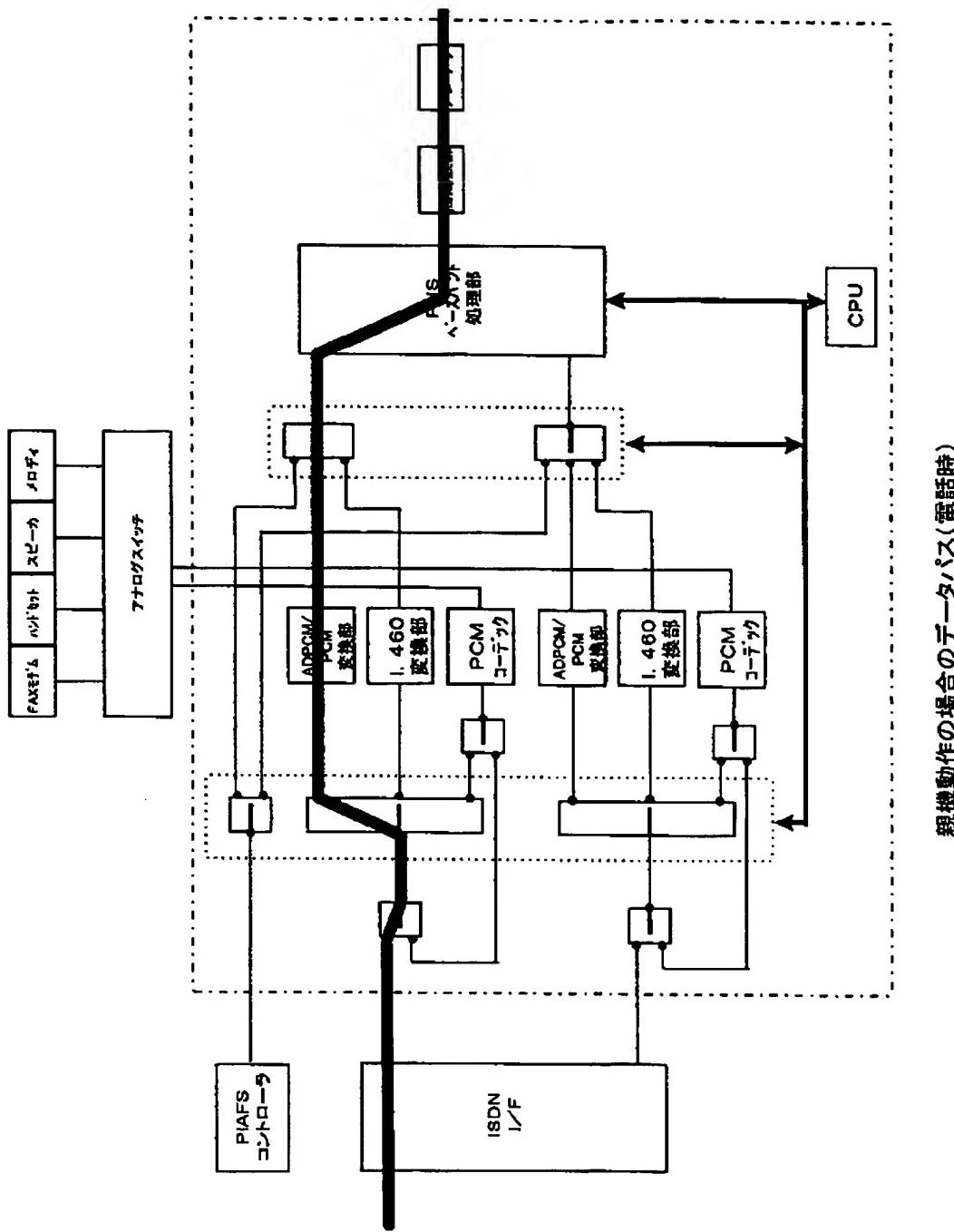


ファクシミリ装置のハード構成

[Figure 3]
Internal structure of the PHS processing section



[Figure 4]



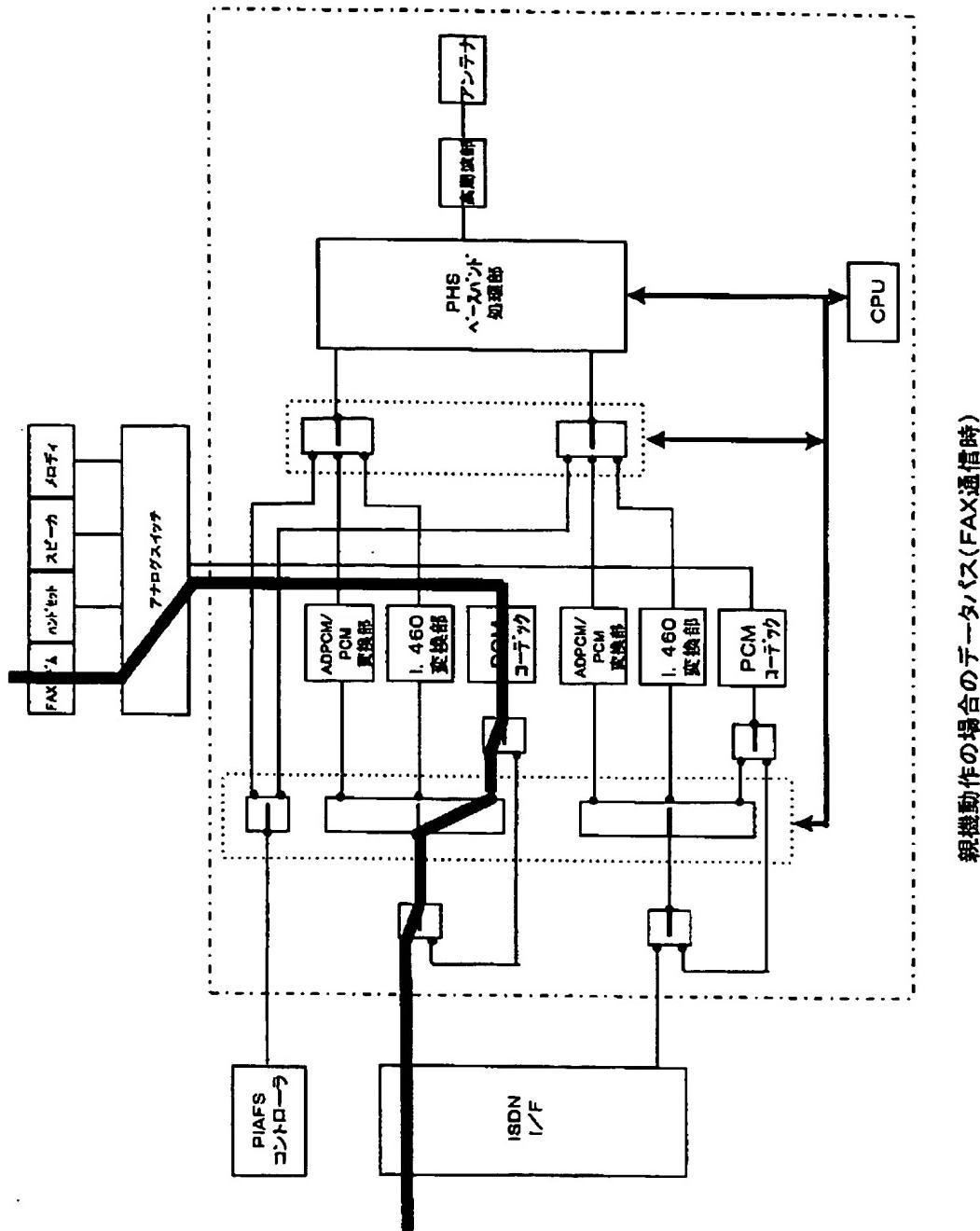
親機動作の場合のデータバス(電話時)

[Figure 4; Translation]

1. Fax modem
2. handset
3. speaker
4. melody
5. analog switch
6. PIAFS controller
7. ADPCM/PCM exchange part
8. I. 460 exchange part

9. PCM codec
10. ADPCM/PCM exchange part
11. I. 460 exchange part
12. PCM codec
13. PHS base band processing part
14. Data pass when moving the parent machine (while on the phone)

[Figure 5]

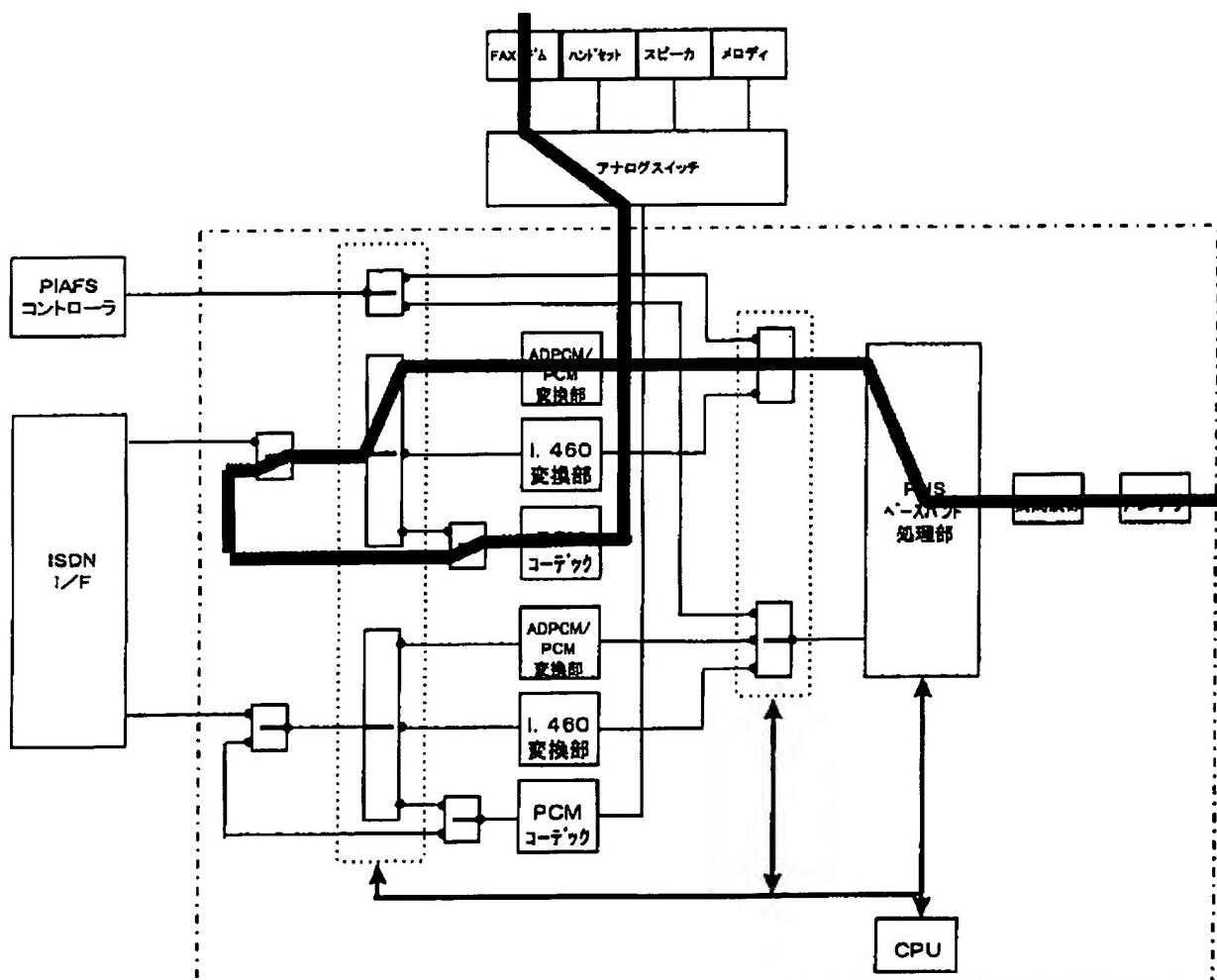


[Figure 5; Translation]

1. Fax modem
2. handset

3. speaker
4. melody
5. analog switch
6. PIAFS controller
7. ADPCM/PCM exchange part
8. I. 460 exchange part
9. PCM codec
10. ADPCM/PCM exchange part
11. I. 460 exchange part
12. PCM codec
13. PHS base band processing part
14. high frequency part
15. antenna
16. Data pass when moving the parent machine (while communicating through fax)

[Figure 6]



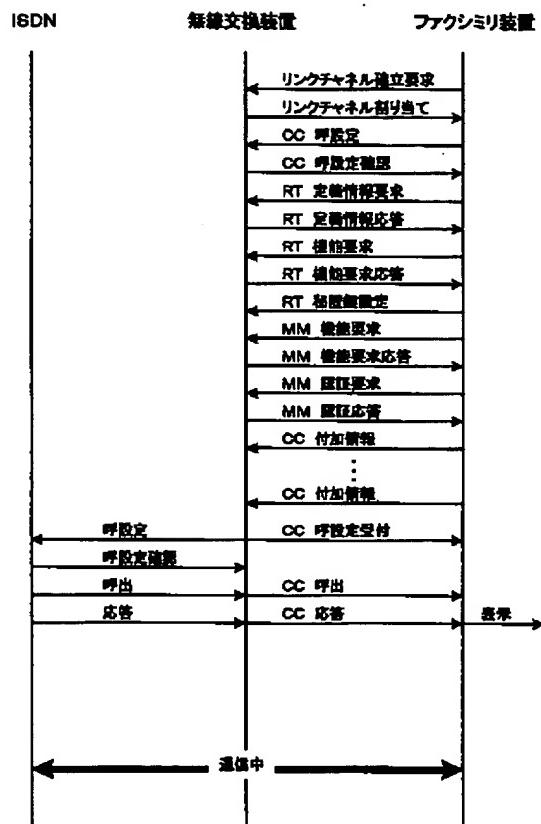
子機動作の場合のデータパス(FAX通信時)

[Figure 6; Translation]

1. Fax modem
2. handset

3. speaker
4. melody
5. analog switch
6. PIAFS controller
7. ADPCM/PCM exchange part
8. I. 460 exchange part
9. PCM codec
10. ADPCM/PCM exchange part
11. I. 460 exchange part
12. PCM codec
13. PHS base band processing part
14. Data pass when moving the sub-machine (while communicating through fax)

[Figure 8]



ファクシミリ装置が子機として機能する場合の発信シーケンス

[Figure 8; Translation]

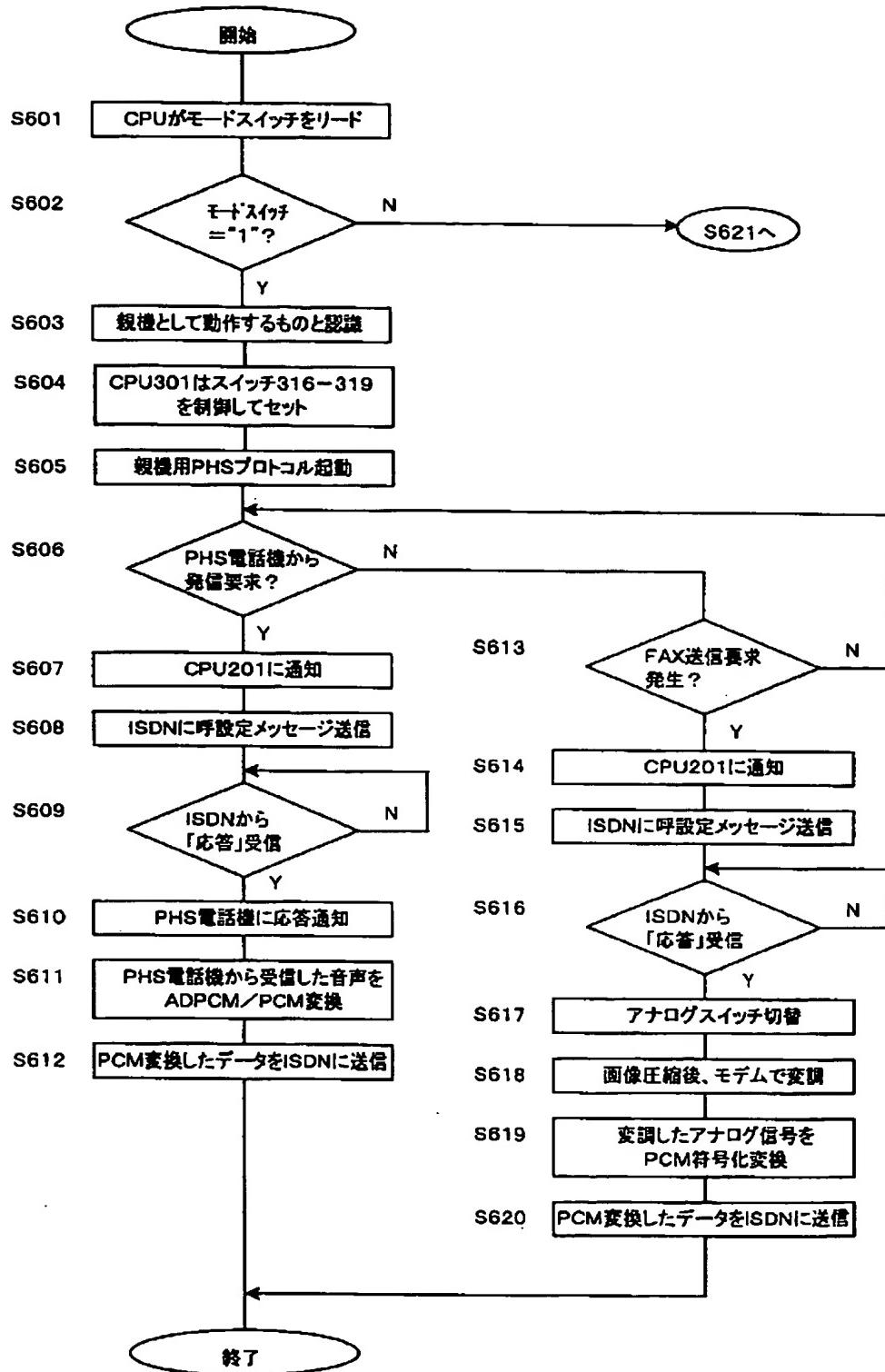
1. wireless exchange machine
2. Facsimile machine
3. link channel establishment demand
4. link channel assigned
5. CC calling setup
6. CC calling setup confirmation
7. RT definition information demand
8. RT definition information response

9. RT function demand
10. RT function demand response
11. RT secret code setup
12. MM function demand
13. MM function demand response
14. MM confirmation demand
15. MM confirmation response
16. CC additional information
17. CC additional information
18. calling setup
19. CC calling setup reception
20. calling setup confirmation
21. calling
22. CC calling
23. response
24. response
25. display
26. communicating
27. Transmission sequence when the facsimile machine functions as a sub-machine

[Figure 9; Translation]

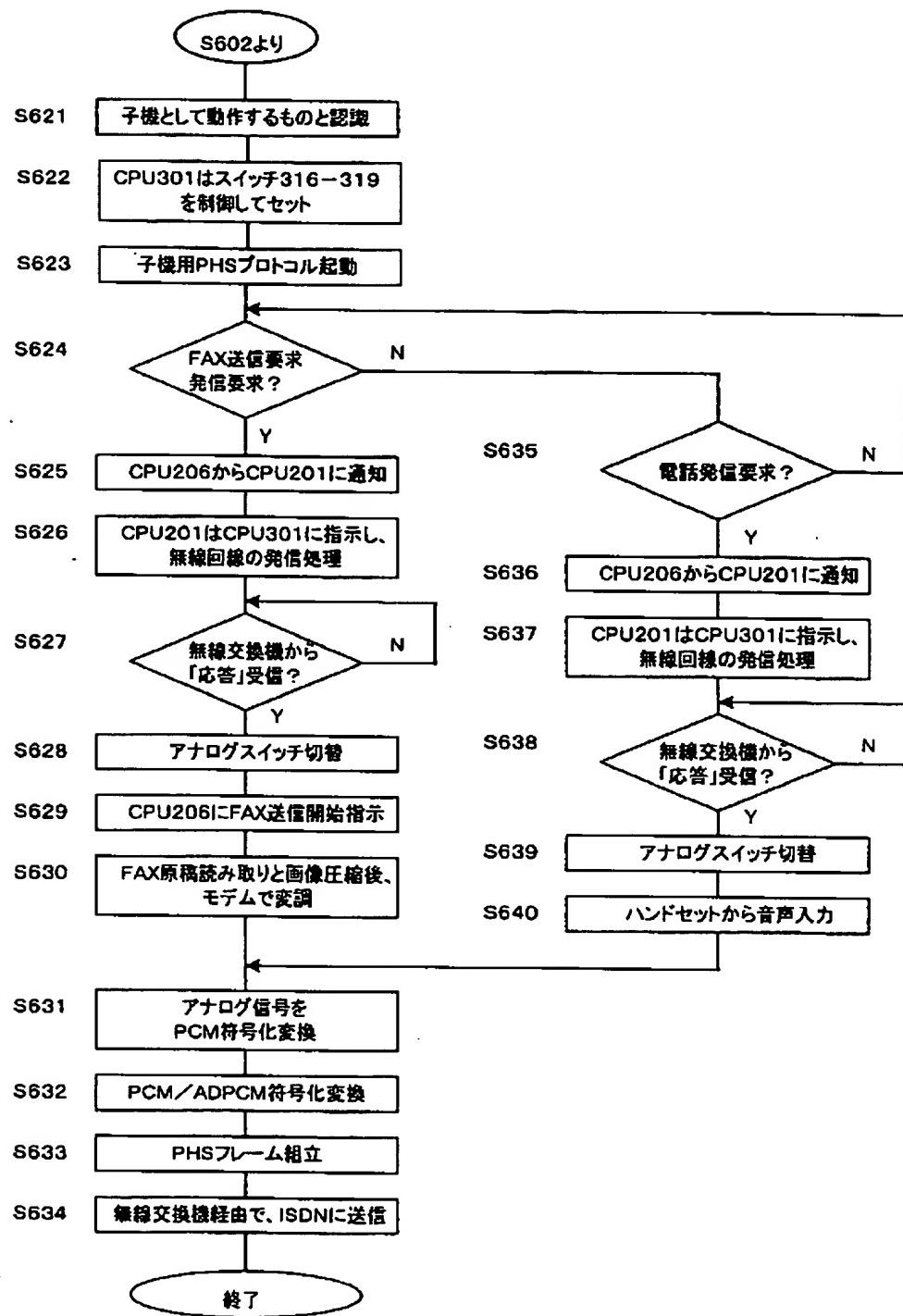
1. Start
 2. to S621
 3. End
 4. Flowchart showing the operation in the parent machine mode
- S601. CPU leads the mode switch
 S602. Mode switch = “1”?
 S603. Confirm that it is going to operate as a parent machine
 S604. Set CPU 301 by controlling switch 316-319
 S605. Startup the PHS protocol for the parent machine
 S606. Is there a communication demand from the PHS phone equipment?
 S607. Notify CPU201
 S608. Transmit call setup message to ISDN
 S609. Reception of “answer” from ISDN
 S610. Automatically notify the PHS phone equipment
 S611. ADPCM/PCM exchange of the voice received from the PHS phone equipment
 S612. Transmit PCM converted date to ISDN
 S613. Did FAX transmittance demand occur?
 S614. Notify CPU201
 S615. Transmit call setup message to ISDN
 S616. Reception of “answer” from ISDN
 S617. Switch the analog switch
 S618. Change the tone after compressing the picture
 S619. Convert the analog signal after changing the tone into PCM code.
 S620. Transmit the PCM converted data to ISDN

[Figure 9]



親機モードでの動作フローチャート

[Figure 10]



子機モードでの動作フローチャート

[Figure 10; Translation]

1. from S602

2. End

3. Flowchart showing the operation in the sub-machine mode

S621. Confirm that it is going to operate as a sub-machine

S622. Set CPU301 by controlling the switch 316-319

S623. Startup the PHS protocol for the sub-machine

S624. Fax transmittance demand transmission demand?

S625. Notify CPU201 from CPU206

S626. CPU201 commands CPU301 and wireless circuit transmission process occurs

S627. Was "answer" received from the wireless exchange equipment?

S628. Switch the analog switch

S629. Display in CPU206 that fax transmission started

S630. Change the tone in the modem after reading the fax script and compressing the picture.

S631. Convert the analog signal into PCM code

S632. Convert the PCM/ADPCM code

S633. Reconstruct the PHS frame

S634. Transmit to ISDN via wireless exchange machine

S635. Is there a phone transmission demand?

S636. Notify CPU201 from CPU206

S637. CPU201 commands CPU301 and wireless circuit transmission is processed

S638. Was "answer" received from the wireless exchange machine?

S639. Switch the analog switch

S640. Voice input from the handset